Spot Safety Project Evaluation

Project Log # 200611070

Spot Safety Project # 07-01-200

Spot Safety Project Evaluation of the Countdown Pedestrian Signal Head Installation At the Intersection of NC 54 (Raleigh Rd) and Hamilton Road Near Chapel Hill, Orange County

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

_____ __2-1-2007____
Jason B. Schronce Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 07-01-200 – The Intersection of NC 54 (Raleigh Rd) and Hamilton Road in Orange County.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of countdown pedestrian signal heads to replace standard pedestrian signal heads. NC 54 (Raleigh Road) has four-lane approaches with a left turn, two through, and a through-right lane. Hamilton Road has two lane approaches with a left turn and a through-right lane. The speed limit is 35 and 25 respectively.

The reason for improvement was to alleviate the potential pedestrian accident problem. From visiting the site, observations were made of pedestrians running across the intersection and having to "dodge" traffic. The multiple lanes, high volume, long cues, and being located in a "high pedestrian environment" (University of Chapel Hill, Shopping Center, and Elementary School) all contribute to this problem.

The initial crash analysis was completed from December 1, 1997 to November 30, 2000 with 23 reported crashes, including one "Pedestrian" accident. The correctable crash resulted in a class "A" injury.

The new countdown signals give pedestrians 25 seconds to cross NC 54 (Raleigh Road) and 12 seconds to cross Hamilton Road.

The final completion date for the improvement at the subject intersection was on February 2, 2002 with a total cost of $5,000.00.

Naive Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from January 1, 2002 to February 28, 2002. The before period consisted of reported crashes from July 1, 1997 through December 31, 2001 (4 years and 6 months) and the after period consisted of reported crashes from March 1, 2002 through August 31, 2006 (4 years and 6 months). The ending date for this analysis was limited by the available crash data at the time of study.

The treatment data consisted of all crashes within 150 feet of the subject intersection. *Please see attached location map and photos for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that pedestrian and bicycle crashes in the crosswalk were the target crashes for the applied countermeasure.

Treatment Information			
	Before	**After**	**Percent Reduction (-) Percent Increase (+)**
Total crashes	43	47	9.30 %
Total Severity Index	7.45	6.74	- 9.53 %
Target Crashes	1	3	200.00 %
Target Crash Severity Index	76.80	31.20	- 59.38 %
Volume	44,000	47,200	7.27 %
Injury Crash Summary			
Fatal injury Crashes	0	1	100.00 %
Class A injury Crashes	1	2	100.00 %
Class B injury Crashes	6	3	- 50.00 %
Class C Injury Crashes	11	13	18.19 %
Total Injury Crashes	18	19	5.55 %

The naive before and after analysis at the treatment location resulted in a 9 percent increase in Total Crashes, a 200 percent increase in Target Crashes, and a 7 percent increase in Average Daily Traffic (ADT). The before period ADT year was 1999 and the after period ADT year was 2004.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 9 percent increase in Total Crashes, a 200 percent increase in Target Crashes, and a 7 percent increase in ADT. The Total Severity Index decreased by 10 percent and the Target Crash Severity Index decreased by 59 percent. The summary results above demonstrate that although the severity decreased, Target Crashes appear to have increased at the treatment location from the before to the after period.

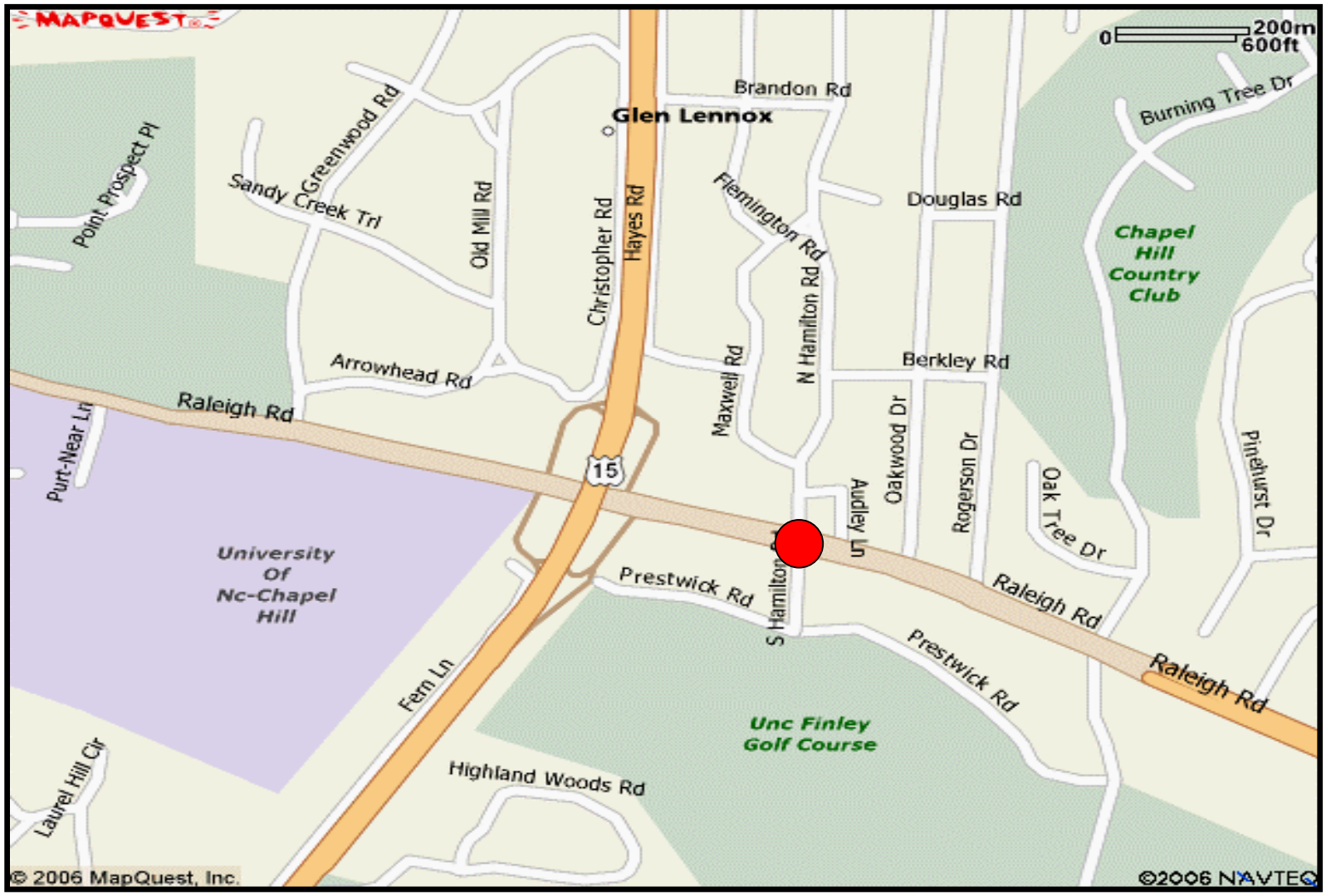
Referencing the *Collision Diagrams,* there is an accurate depiction of the many activities that crowd this intersection. With a high volume of off-campus housing for the University of North Carolina on Hamilton Road and shopping centers located at the intersection, pedestrian traffic appears to only become an increasing concern.

The Target Severity figure is not an accurate judge of the effectiveness of the countermeasure. Even though the after period severity decreased by half, the additional target crashes aided in that reduction. The before period consisted of 1 Target crash with a class “A” injury. The after period consisted of 3 Target crashes; 1 class “A, B, and C.”

Please see the attached *Treatment Site Photos*. Photos are provided for all approaches to the treatment intersection.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of intersection.

Location Map
Orange County
Evaluation of Spot Safety Project # 07-01-200



Treatment Location: NC 54 (Raleigh Rd) and Hamilton Road near Chapel Hill, NC


N
© 2007 Europa Technologies
Google
Pointer 35°54'29.07" N 79°01'25.32" W elev 307 ft Streaming 100%
Eye alt 1210 ft

Treatment Site Photos Taken December 13, 2006

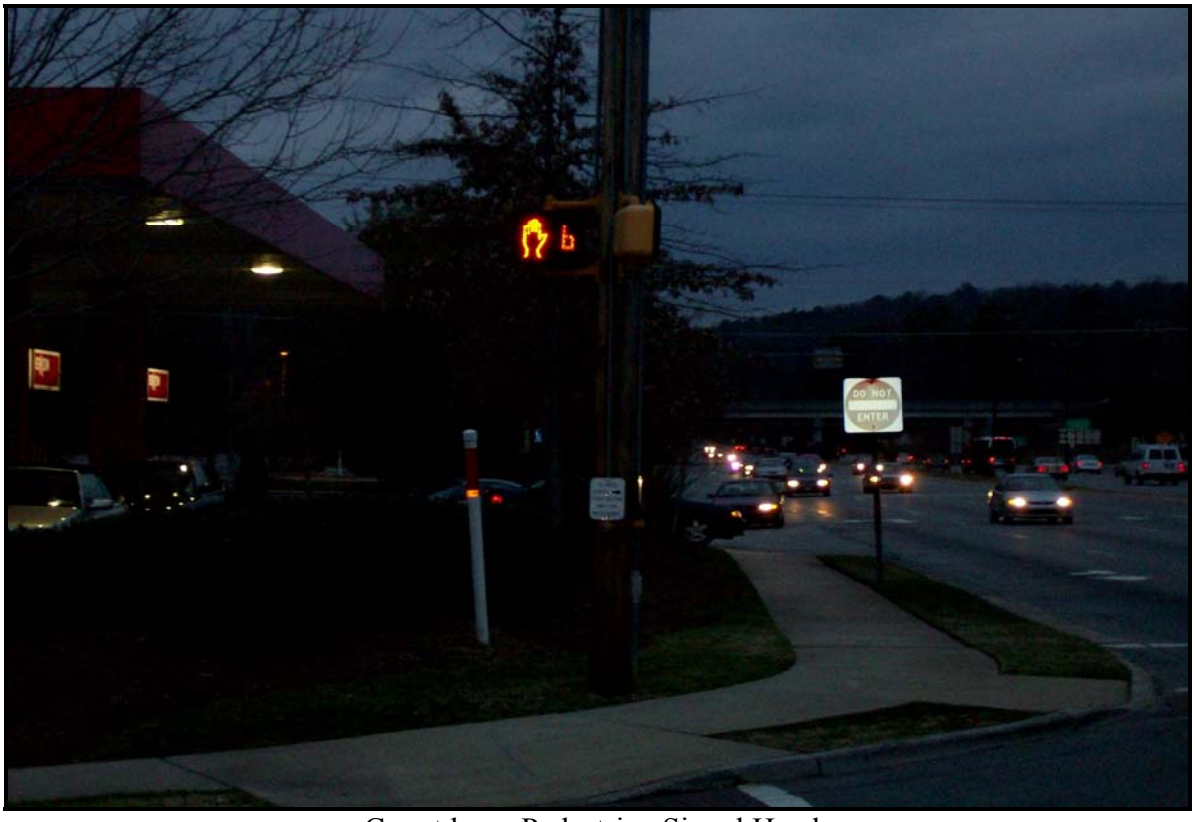
Facing West on NC 54 (Raleigh Road)

Facing East on NC 54 (Raleigh Road)

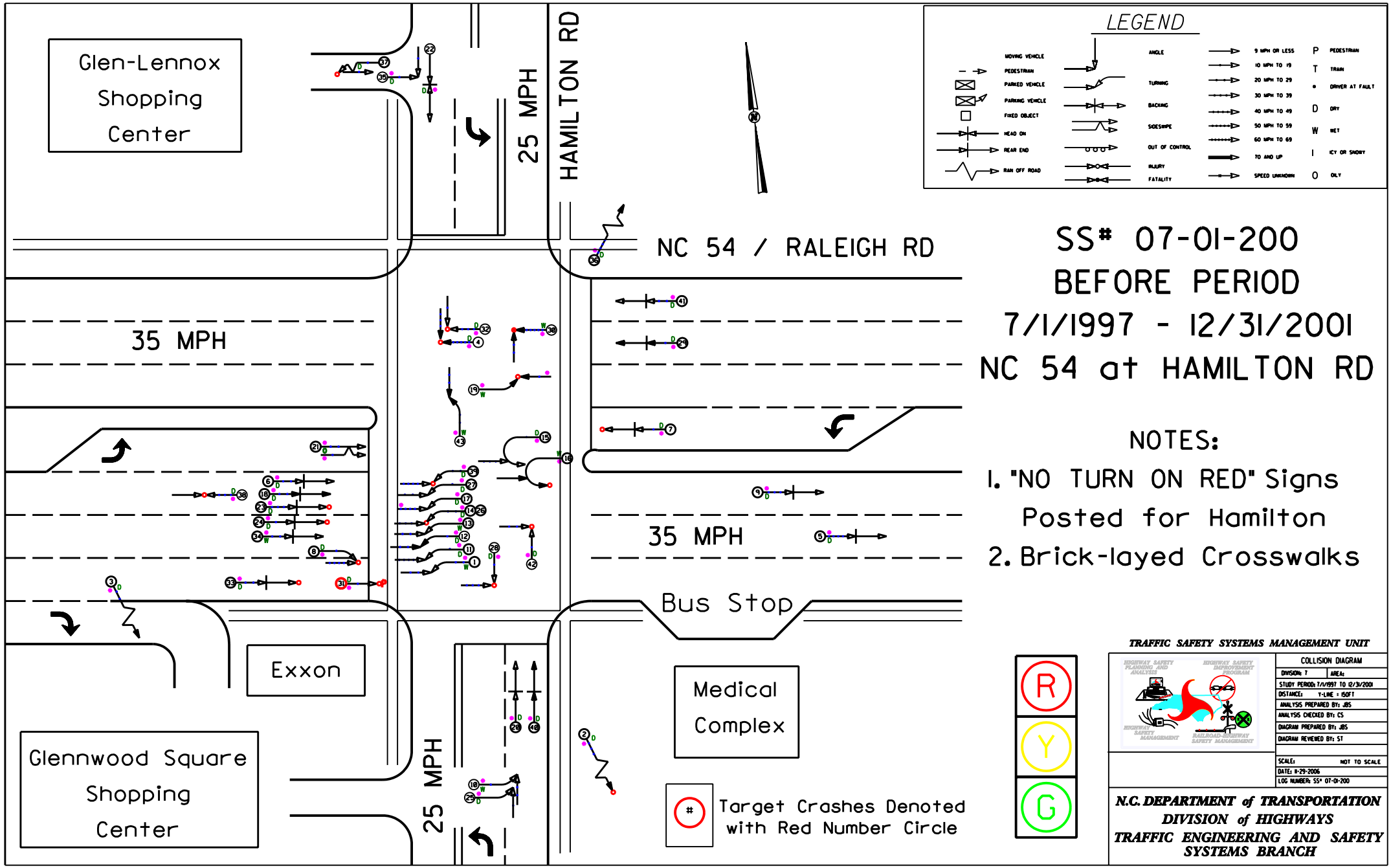
Looking Northbound on Hamilton Road

Looking Southbound on Hamilton Road

Crosswalk Activation Signal



Countdown Pedestrian Signal Heads



SS# 07-01-200
BEFORE PERIOD
7/1/1997 - 12/31/2001
NC 54 at HAMILTON RD

NOTES:

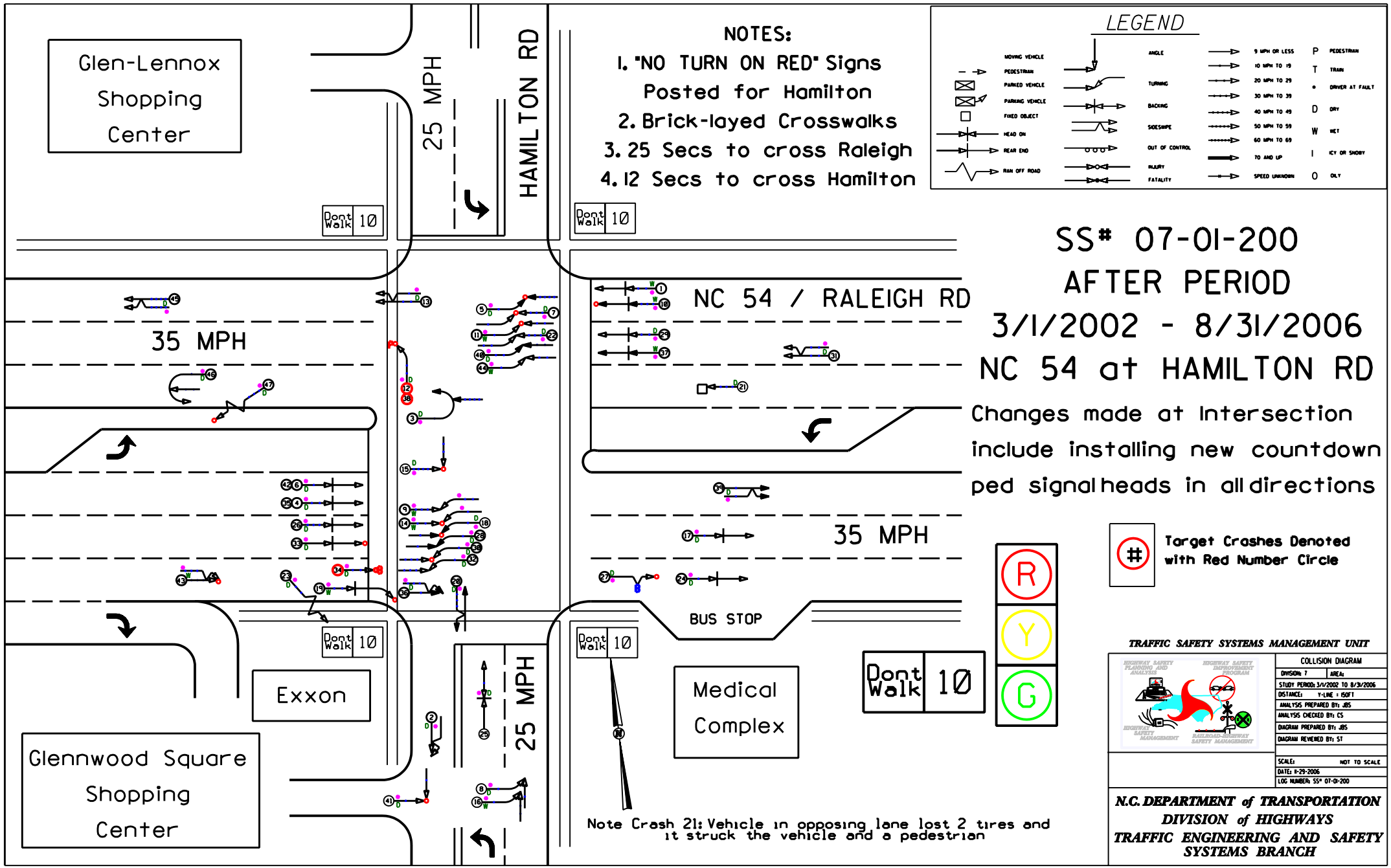
1. "NO TURN ON RED" Signs Posted for Hamilton
2. Brick-layed Crosswalks

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

COLLISION DIAGRAM

DIVISION: 7	AREA:
STUDY PERIOD: 7/1/1997 TO 12/31/2001	
DISTANCE:	Y-LINE = 150FT
ANALYSIS PREPARED BY: JBS	
ANALYSIS CHECKED BY: CS	
DIAGRAM PREPARED BY: JBS	
DIAGRAM REVIEWED BY: ST	
SCALE:	NOT TO SCALE
DATE: 11-29-2006	
LOG NUMBER: SS# 07-01-200	

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH



SS# 07-01-200
AFTER PERIOD
3/1/2002 - 8/31/2006
NC 54 at HAMILTON RD

Changes made at intersection include installing new countdown ped signalheads in all directions

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

COLLISION DIAGRAM
DIVISION: 7 AREA:
STUDY PERIOD: 3/1/2002 TO 8/31/2006
DISTANCE: Y-LINE : 150FT
ANALYSIS PREPARED BY: JBS
ANALYSIS CHECKED BY: CS
DIAGRAM PREPARED BY: JBS
DIAGRAM REVIEWED BY: ST
SCALE: NOT TO SCALE
DATE: 9-29-2006
LOG NUMBER: SS# 07-01-200

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH